High School Sports Event Coverage

CJ Duffaut, MD
UCLA Primary Care Sports Medicine

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Outline

- Emergency Action Plan (EAP)
- Spinal Injuries
- Concussion
- Fracture/Dislocation
- Dental
- Ocular
- ENT

Emergency Action Plan

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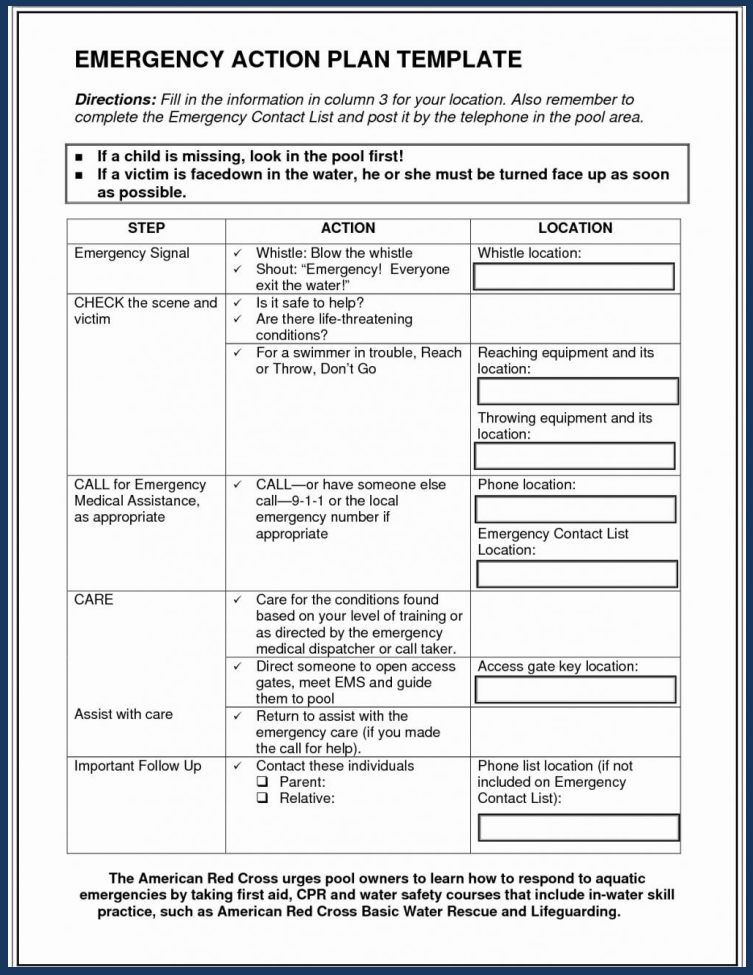
- Personal
- Equipment
- Communication
- Transportation
- Venue location
- Emergency care facilities
- Documentation



EMERGENCY ACTION PLAN TEMPLATE

Directions: *Fill in the information in column 3 for your location. Also remember to complete the Emergency Contact List and post it by the telephone in the pool area.*

- **If a child is missing, look in the pool first!**
- **If a victim is facedown in the water, he or she must be turned face up as soon as possible.**

STEP	ACTION	LOCATION
Emergency Signal	✓ Whistle: Blow the whistle ✓ Shout: "Emergency! Everyone exit the water!"	Whistle location:
CHECK the scene and victim	✓ Is it safe to help? ✓ Are there life-threatening conditions?	
	✓ For a swimmer in trouble, Reach or Throw, Don't Go	Reaching equipment and its location: Throwing equipment and its location:
CALL for Emergency Medical Assistance, as appropriate	✓ CALL—or have someone else call—9-1-1 or the local emergency number if appropriate	Phone location: Emergency Contact List Location:
CARE	✓ Care for the conditions found based on your level of training or as directed by the emergency medical dispatcher or call taker.	
	✓ Direct someone to open access gates, meet EMS and guide them to pool	Access gate key location:
Assist with care	✓ Return to assist with the emergency care (if you made the call for help).	
Important Follow Up	✓ Contact these individuals ❑ Parent: ❑ Relative:	Phone list location (if not included on Emergency Contact List):

The American Red Cross urges pool owners to learn how to respond to aquatic emergencies by taking first aid, CPR and water safety courses that include in-water skill practice, such as American Red Cross Basic Water Rescue and Lifeguarding.

Primary Survey

- Airway & cervical spine control
- Breathing
- Circulation
- Disability
- Exposure & environment

Secondary Survey

- Head-to-toe examination
- Ears, eyes, nose, throat, teeth/gums
- Respiratory system
- Cardiovascular system
- Abdominal exam
- MSK exam
- Neurological exam

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COLLAPSED ATHLET

Cardiac Causes

- Structural heart
  - Hypertrophic cardiomyopathy (HCM)
  - Congenital coronary-artery anomalies
  - Arrhythmogenic right ventricular cardiomyopathy (ARVC)
- Primary electrical abnormalities
  - Long QT syndrome
  - Brugada syndrome
  - Wolff-Parkinson White (WPW) syndrome
  - Catecholaminergic polymorphic ventricular tachycardia
- External causes
  - Commotio cordis

AED Use

- Single greatest factor affecting survival after out-of-hospital cardiac arrest is the time interval from arrest to defibrillation
- Survival rates have been shown to be 41-74% if bystander CPR is provided and defibrillation occurs within 3-5 minutes of collapse
- Drezner et al looked at the SCA in 2149 high schools over a 2 year period
  - 59 cases of SCA - 42 (71%) of them survived to hospital discharge
  - 34 out of 39 (87%) people survived if a shock was delivered onsite
- Maron et al looked at 128 cases of commotio cordis & found survival rate was 16%
  - 19 of 41 (41%) individuals who received defibrillation survived

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CERVICAL SPINE

Cervical Spine Injury

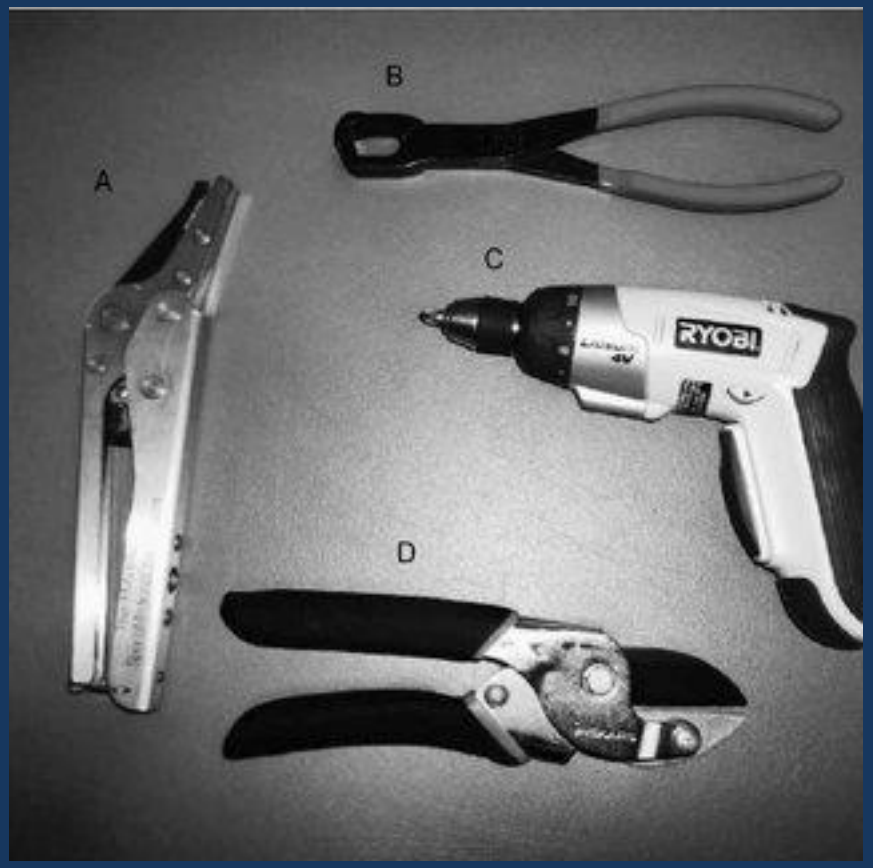
- Requires cervical spine stabilization
  - Unconsciousness or altered level of consciousness
  - Bilateral neurologic findings or complaint
  - Significant midline spine pain with or without palpation
  - Obvious spinal column deformity

Cervical Spine Injury

- Stabilization
  - Ensure the cervical spine is in a neutral position and immediately apply manual stabilization
- Airway
  - Immediately attempt to expose the airway
  - Jaw-thrust recommended over head-tilt technique

Facemask Removal

- Initiate once decision to immobilize & transport has been made
- Cordless screwdriver
- Backup cutting tool



Cervical Stabilization

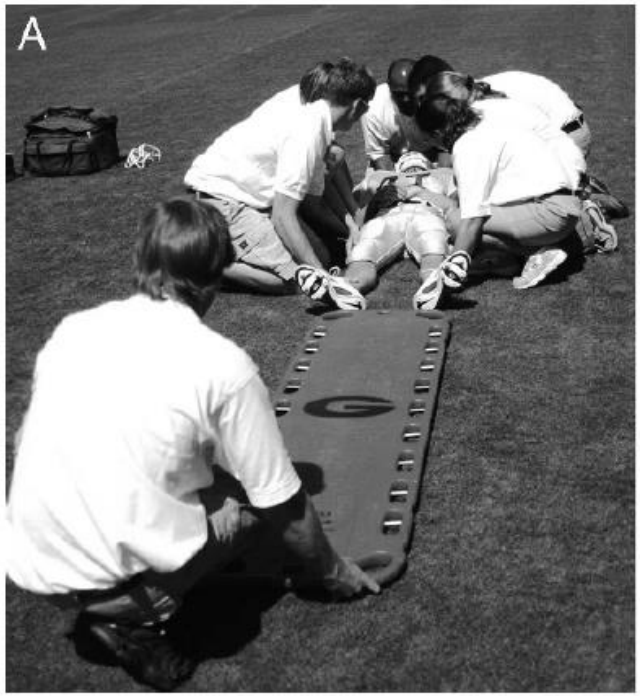
- When not to move spine into neutral position
  - Movement causes increased pain, neurologic symptoms, muscle spasm or airway compromise
  - It is physically difficult to reposition the spine
  - Resistance is encountered during the attempt at realignment
  - The patient expresses apprehension

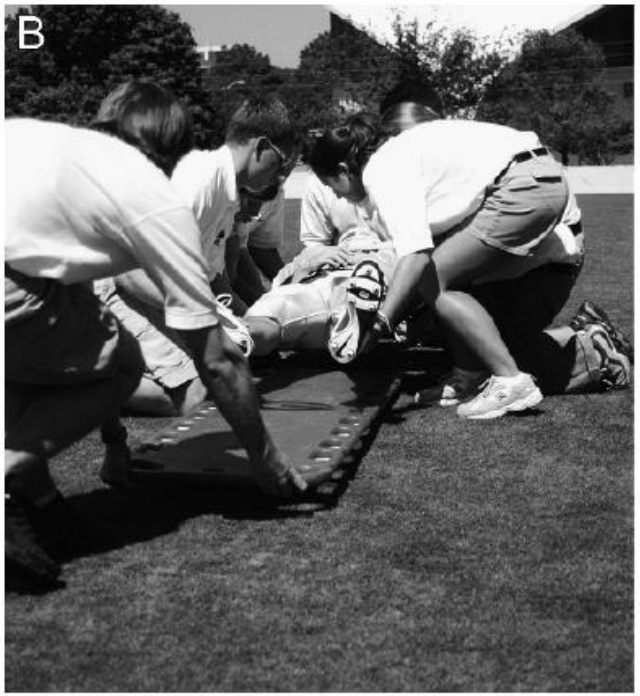
Transfer & Immobilization

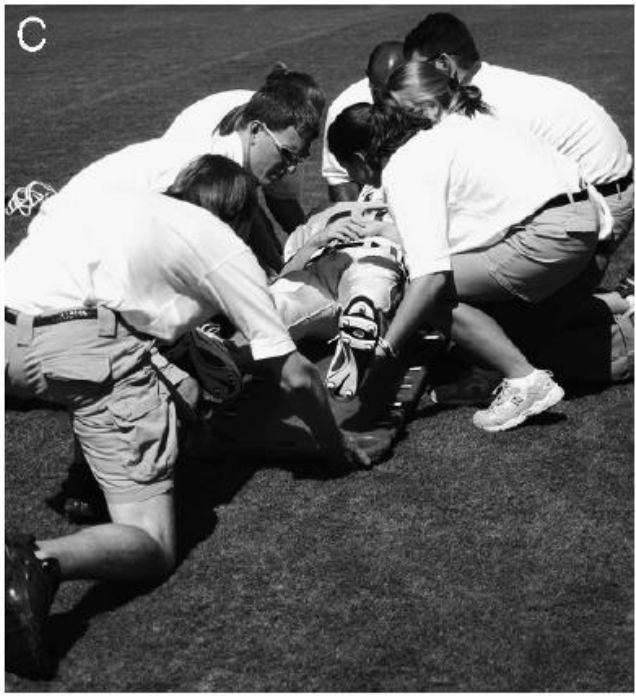
- 2 techniques
  - Log-roll
  - 8 person lift (lift & slide)
- Use technique that rescuers are familiar with & produces the least amount of spinal movement
- Arms moved to the sides & legs straightened

8 Person Lift

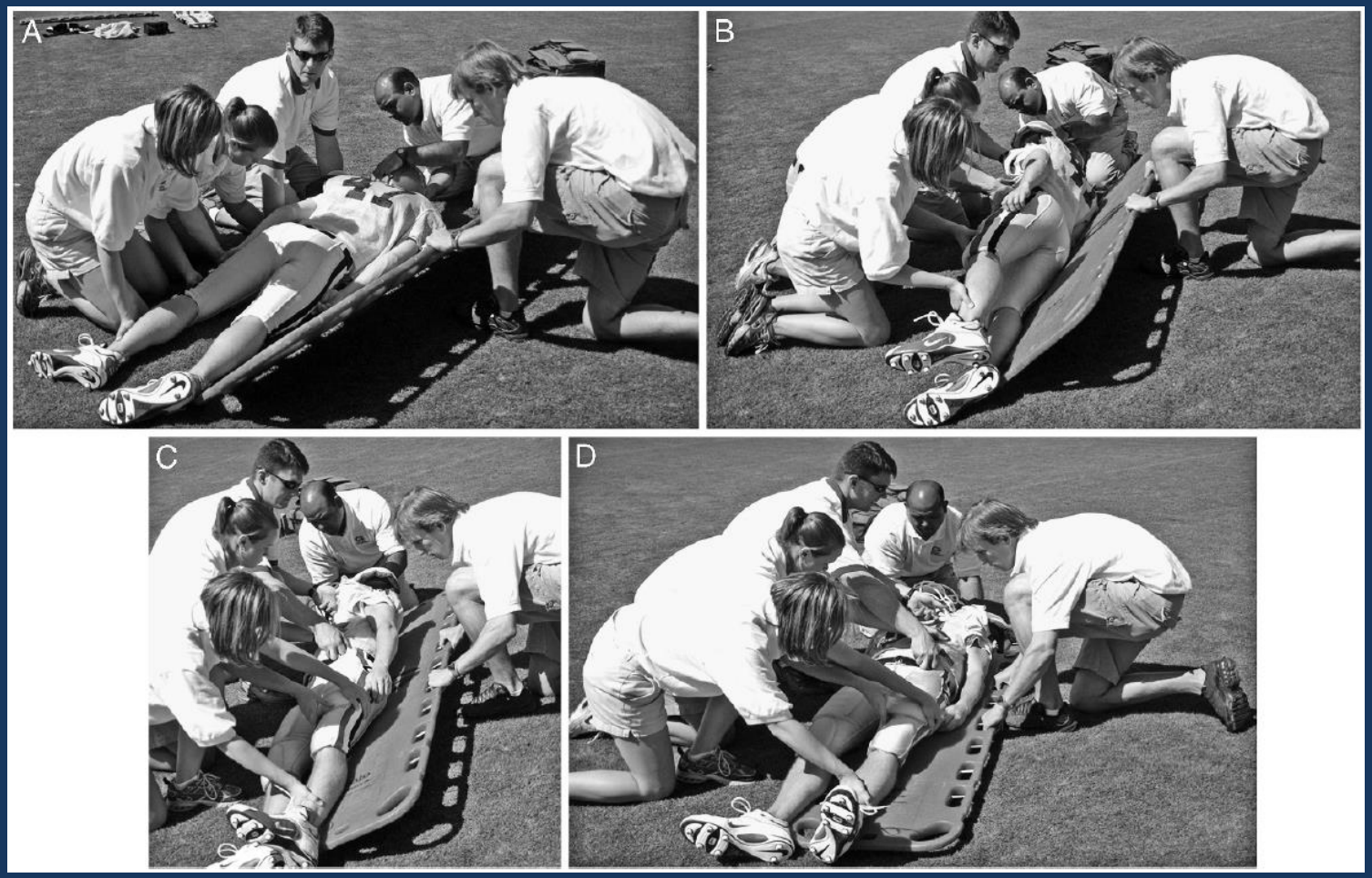
- Requires 8 people







Prone Log-roll



Equipment Removal

- 2015 NATA recommended protective athletic equipment be removed prior to transportation
- Rationale
  - Advances in equipment technology
  - Should be performed by those with highest level of training
  - Expedited access to the athlete for enhanced care
  - Chest access is prioritized
- Need at least 3 experienced rescuers

Equipment Removal

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Helmet Removal

Helmet Removal

Shoulder Pad Removal

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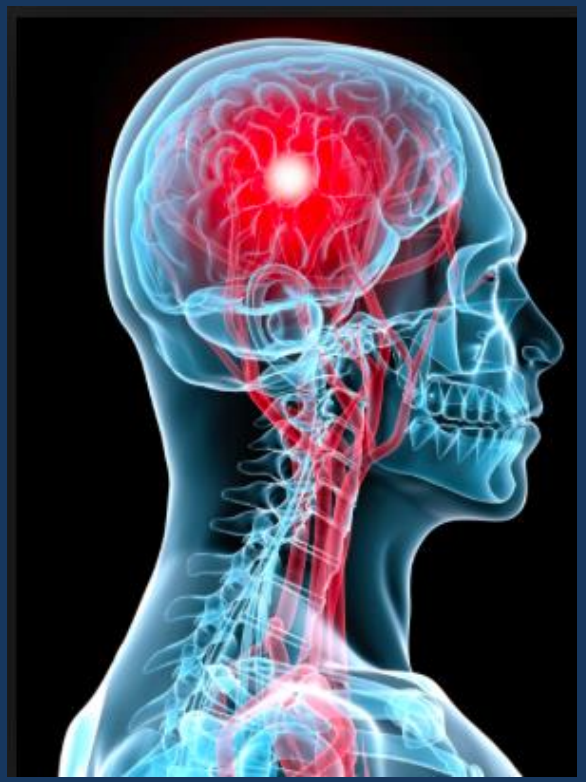
CONCUSSION



Sports-Related Concussion

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- Definition: traumatically induced transient disturbance of brain function that involves a complex pathophysiological process
- Signs & symptoms cannot be otherwise explained by drug, alcohol, medication use or other injuries (such as cervical injuries or peripheral vestibular dysfunction) or other comorbidities (psychological or medical conditions)
- 1.0–1.8 million SRCs per year in the those < 19
  - 400 000 SRCs in high school athletes

Diagnosis

- Complicated – lack of validated, objective diagnostic tests, a reliance on self-reported symptoms, and confounding symptoms caused by other common conditions
- Recommended to have a baseline evaluation
  - SCAT 5
  - Computerized proprietary neuropsychological tests (i.e. Impact)

Immediate Removal

- LOC
- Impact seizure
- Tonic posturing
- Gross motor instability
- Confusion or amnesia

More Serious Head Injury

- Prolonged LOC
- Severe or worsening headache
- Repeated emesis
- Declining mental status
- Focal neurological deficit
- Suspicion of cervical spine injury

SCAT 5

- Standardized approach to sideline evaluation
- Components
  - Symptom checklist *
  - Brief cognitive assessment
  - Brief neurological examination
  - Balance assessment
- Performed in a distraction free environment

Initial Evaluation

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STEP 1: RED FLAGS

RED FLAGS:

- Neck pain or tenderness
- Double vision
- Weakness or tingling/ burning in arms or legs
- Severe or increasing headache
- Seizure or convulsion
- Loss of consciousness
- Deteriorating conscious state
- Vomiting
- Increasingly restless, agitated or combative

STEP 2: OBSERVABLE SIGNS

Witnessed ☐ Observed on Video ☐

Lying motionless on the playing surface	Y	N
Balance / gait difficulties / motor incoordination: stumbling, slow / laboured movements	Y	N
Disorientation or confusion, or an inability to respond appropriately to questions	Y	N
Blank or vacant look	Y	N
Facial injury after head trauma	Y	N

STEP 3: MEMORY ASSESSMENT MADDOCKS QUESTIONS[2]

"I am going to ask you a few questions, please listen carefully and give your best effort. First, tell me what happened?"

Mark Y for correct answer / N for incorrect

What venue are we at today?	Y	N
Which half is it now?	Y	N
Who scored last in this match?	Y	N
What team did you play last week / game?	Y	N
Did your team win the last game?	Y	N

STEP 4: EXAMINATION GLASGOW COMA SCALE (GCS)[3]

Time of assessment			
Date of assessment			
Best eye response (E)			
No eye opening	1	1	1
Eye opening in response to pain	2	2	2
Eye opening to speech	3	3	3
Eyes opening spontaneously	4	4	4
Best verbal response (V)			
No verbal response	1	1	1
Incomprehensible sounds	2	2	2
Inappropriate words	3	3	3
Confused	4	4	4
Oriented	5	5	5
Best motor response (M)			
No motor response	1	1	1
Extension to pain	2	2	2
Abnormal flexion to pain	3	3	3
Flexion / Withdrawal to pain	4	4	4
Localizes to pain	5	5	5
Obeys commands	6	6	6
Glasgow Coma score (E + V + M)			

CERVICAL SPINE ASSESSMENT

Does the athlete report that their neck is pain free at rest?	Y	N
If there is NO neck pain at rest, does the athlete have a full range of ACTIVE pain free movement?	Y	N
Is the limb strength and sensation normal?	Y	N

Symptom Check

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STEP 2: SYMPTOM EVALUATION

The athlete should be given the symptom form and asked to read this instruction paragraph out loud then complete the symptom scale. For the baseline assessment, the athlete should rate his/her symptoms based on how he/she typically feels and for the post injury assessment the athlete should rate their symptoms at this point in time.

Please Check: ☐ **Baseline** ☐ **Post-Injury**

Please hand the form to the athlete

	none	mild		moderate		severe	
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Trouble falling asleep (if applicable)	0	1	2	3	4	5	6
Total number of symptoms:							of 22
Symptom severity score:							of 132
Do your symptoms get worse with physical activity?						Y	N
Do your symptoms get worse with mental activity?						Y	N

Cognitive Screening

STEP 3: COGNITIVE SCREENING

Standardised Assessment of Concussion (SAC)[4]

ORIENTATION

What month is it?	0	1
What is the date today?	0	1
What is the day of the week?	0	1
What year is it?	0	1
What time is it right now? (within 1 hour)	0	1
Orientation score		of 5

IMMEDIATE MEMORY

The Immediate Memory component can be completed using the traditional 5-word per trial list or optionally using 10-words per trial to minimise any ceiling effect. All 3 trials must be administered irrespective of the number correct on the first trial. Administer at the rate of one word per second.

Please choose EITHER the 5 or 10 word list groups and circle the specific word list chosen for this test.

I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order. For Trials 2 & 3: I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before.

List	Alternate 5 word lists					Score (of 5) Trial 1	Trial 2	Trial 3
A	Finger	Penny	Blanket	Lemon	Insect			
B	Candle	Paper	Sugar	Sandwich	Wagon			
C	Baby	Monkey	Perfume	Sunset	Iron			
D	Elbow	Apple	Carpet	Saddle	Bubble			
E	Jacket	Arrow	Pepper	Cotton	Movie			
F	Dollar	Honey	Mirror	Saddle	Anchor			
					Immediate Memory Score			of 15
					Time that last trial was completed			

Concentration

CONCENTRATION

DIGITS BACKWARDS

Please circle the Digit list chosen (A, B, C, D, E, F). Administer at the rate of one digit per second reading DOWN the selected column.

I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.

Concentration Number Lists (circle one)					
List A	List B	List C			
4-9-3	5-2-6	1-4-2	Y	N	0
6-2-9	4-1-5	6-5-8	Y	N	1
3-8-1-4	1-7-9-5	6-8-3-1	Y	N	0
3-2-7-9	4-9-6-8	3-4-8-1	Y	N	1
6-2-9-7-1	4-8-5-2-7	4-9-1-5-3	Y	N	0
1-5-2-8-6	6-1-8-4-3	6-8-2-5-1	Y	N	1
7-1-8-4-6-2	8-3-1-9-6-4	3-7-6-5-1-9	Y	N	0
5-3-9-1-4-8	7-2-4-8-5-6	9-2-6-5-1-4	Y	N	1

MONTHS IN REVERSE ORDER

Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November. Go ahead.

Dec - Nov - Oct - Sept - Aug - Jul - Jun - May - Apr - Mar - Feb - Jan	0 1
Months Score	of 1
Concentration Total Score (Digits + Months)	of 5

Neurological Exam

STEP 4: NEUROLOGICAL SCREEN

See the instruction sheet (page 7) for details of test administration and scoring of the tests.

Can the patient read aloud (e.g. symptom check-list) and follow instructions without difficulty?	Y	N
Does the patient have a full range of pain-free PASSIVE cervical spine movement?	Y	N
Without moving their head or neck, can the patient look side-to-side and up-and-down without double vision?	Y	N
Can the patient perform the finger nose coordination test normally?	Y	N
Can the patient perform tandem gait normally?	Y	N

Delayed Recall

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STEP 5: DELAYED RECALL:

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section. Score 1 pt. for each correct response.

Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order.

Time Started

Please record each word correctly recalled. Total score equals number of words recalled.

Total number of words recalled accurately: of 5 or of 10

BESS

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BALANCE EXAMINATION

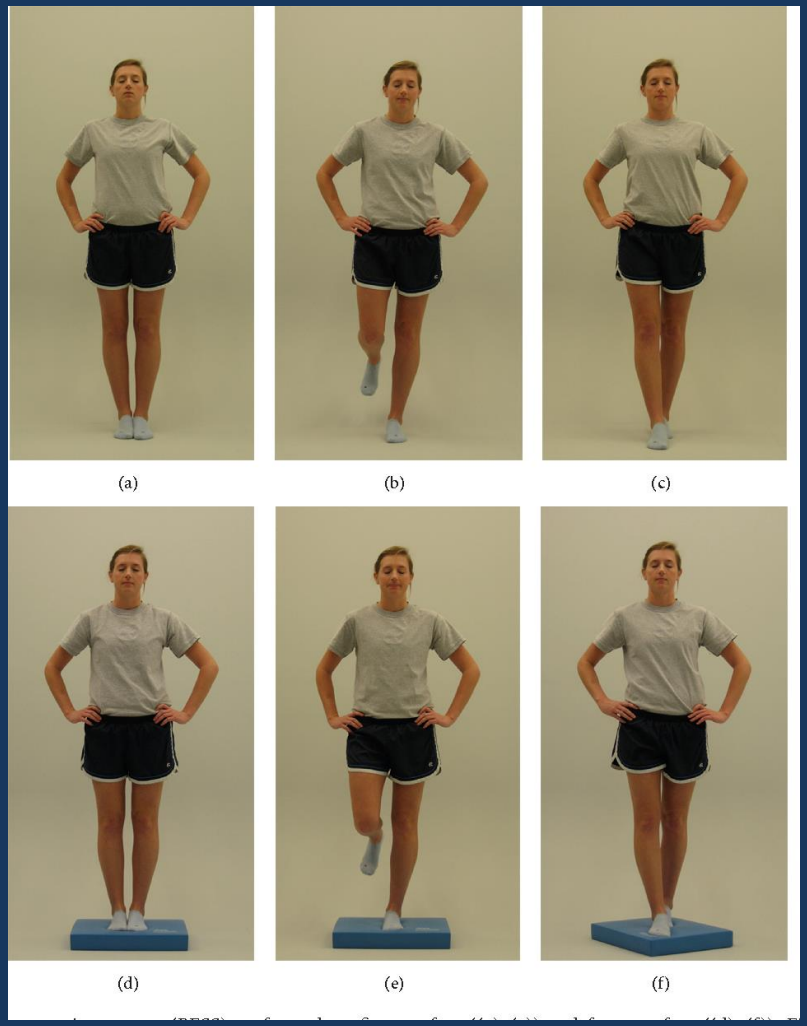
Modified Balance Error Scoring System (mBESS) testing[5]

Which foot was tested
(i.e. which is the non-dominant foot)
☐ Left
☐ Right

Testing surface (hard floor, field, etc.) _____

Footwear (shoes, barefoot, braces, tape, etc.) _____

Condition	Errors
Double leg stance	of 10
Single leg stance (non-dominant foot)	of 10
Tandem stance (non-dominant foot at the back)	of 10
Total Errors	of 30



Types of errors

1. Hands lifted off iliac crest
2. Opening eyes
3. Step, stumble, or fall
4. Moving hip into > 30 degrees abduction
5. Lifting forefoot or heel
6. Remaining out of test position > 5 sec

Decision

STEP 6: DECISION

Domain	Date & time of assessment:		
Symptom number (of 22)			
Symptom severity score (of 132)			
Orientation (of 5)			
Immediate memory	of 15 of 30	of 15 of 30	of 15 of 30
Concentration (of 5)			
Neuro exam	Normal Abnormal	Normal Abnormal	Normal Abnormal
Balance errors (of 30)			
Delayed Recall	of 5 of 10	of 5 of 10	of 5 of 10

Date and time of injury: _____

If the athlete is known to you prior to their injury, are they different from their usual self?
☐ **Yes** ☐ **No** ☐ **Unsure** ☐ **Not Applicable**
(If different, describe why in the clinical notes section)

Concussion Diagnosed?
☐ **Yes** ☐ **No** ☐ **Unsure** ☐ **Not Applicable**

If re-testing, has the athlete improved?
☐ **Yes** ☐ **No** ☐ **Unsure** ☐ **Not Applicable**

I am a physician or licensed healthcare professional and I have personally administered or supervised the administration of this SCAT5.

Signature: _____

Name: _____

Title: _____

Registration number (if applicable): _____

Date: _____

SCORING ON THE SCAT5 SHOULD NOT BE USED AS A STAND-ALONE METHOD TO DIAGNOSE CONCUSSION, MEASURE RECOVERY OR MAKE DECISIONS ABOUT AN ATHLETE'S READINESS TO RETURN TO COMPETITION AFTER CONCUSSION.

Signs to Watch for

- Worsening headache
- Drowsiness or inability to be awakened
- Inability to recognize people or places
- Repeated vomiting
- Unusual behavior or confusion or irritable
- Seizures (arms and legs jerk uncontrollably)
- Weakness or numbness in arms or legs
- Unsteadiness on their feet.
- Slurred speech

Return to Sport

Exercise step	Functional exercise at each step	Goal of each step
1. Symptom-limited activity	Daily activities that do not provoke symptoms.	Gradual reintroduction of work/school activities.
2. Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training.	Increase heart rate.
3. Sport-specific exercise	Running or skating drills. No head impact activities.	Add movement.
4. Non-contact training drills	Harder training drills, e.g., passing drills. May start progressive resistance training.	Exercise, coordination, and increased thinking.
5. Full contact practice	Following medical clearance, participate in normal training activities.	Restore confidence and assess functional skills by coaching staff.
6. Return to play/sport	Normal game play.	

80%–90% of concussed older adolescents and adults return in 2 weeks & younger athletes in 4 weeks

CIF Return to Sport

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Date & Initials	Stage	Activity	Exercise Example	Objective of the Stage
	I	No physical activity for at least 2 full symptom-free days **AFTER** you have seen a physician	No activities requiring exertion (weight lifting, jogging, P.E. classes)	Recovery and elimination of symptoms
	II-A	Light aerobic activity	• 10-15 minutes of walking or stationary biking • **Must be performed under direct supervision by designated individual**	• Increase heart rate to no more than 50% of perceived max. exertion (e.g.,< 100 beats per minute) • Monitor for symptom return
	II-B	Moderate aerobic activity Light resistance training	• 20-30 minutes jogging or stationary biking • Body weight exercises (squats, planks, push-ups), max 1 set of 10, no more than 10 min total	• Increase heart rate to 50-75% max. exertion (e.g.,100-150 bpm) • Monitor for symptom return
	II-C	Strenuous aerobic activity Moderate resistance training	• 30-45 minutes running or stationary biking • Weight lifting ≤ 50% of max weight	• Increase heart rate to > 75% max. exertion • Monitor for symptom return
	II-D	Non-contact training with sport-specific drills No restrictions for weightlifting	• Non-contact drills, sport-specific activities (cutting, jumping, sprinting) • No contact with people, padding or the floor/mat	• Add total body movement • Monitor for symptom return
Minimum of 6 days to pass Stages I and II. Prior to beginning Stage III, please make sure that written physician (MD/DO) clearance for return to play, after successful completion of Stages I and II, has been given to your school's concussion monitor.				
	III	Limited contact practice Full contact practice	• Controlled contact drills allowed (no scrimmaging) • Return to normal training (with contact)	• Increase acceleration, deceleration and rotational forces • Restore confidence, assess readiness for return to play • Monitor for symptom return
MANDATORY: You must complete at least ONE contact practice before return to competition. (Highly recommend that Stage III be divided into 2 contact practice days as outlined above.)				
	IV	Return to play (competition)	Normal game play	Return to full sports activity without restrictions

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DISLOCATION

Dislocations

- 3.6% of the 2.6 million sports and recreational-related injuries annually
- 3 most common
  - Shoulder (54.9%)
  - Wrist/hand (16.5%)
  - Knee (16%)

Dislocations

- Most are nonemergent and can be managed on the sideline
- Neurovascular status is the initial & most important step
- On the-field attempt to restore neurovascular status to the compromised extremity is reasonable and encouraged
- Multiple attempts should not be performed unless emergency transport to the appropriate facility is unavailable for a substantial amount of time

Shoulder Dislocation

- 95% dislocate anteriorly
- Present with arm slight abducted & internally rotated
- Shoulder looses normal rounded appearance
- Different reduction techniques
- Best to reduce off the field

Reduction Techniques

- Traction-countertraction
- Chair method
- Spaso method
- Milch method
- Stimson method
- Kocher method
- Scapular manipulation
- External rotation
- Fast, Reliable, and Safe (FARES)

*Axillary Nerve & pulses checked before & after

Traction-countertraction

Chair Method

Spaso method

Milch method

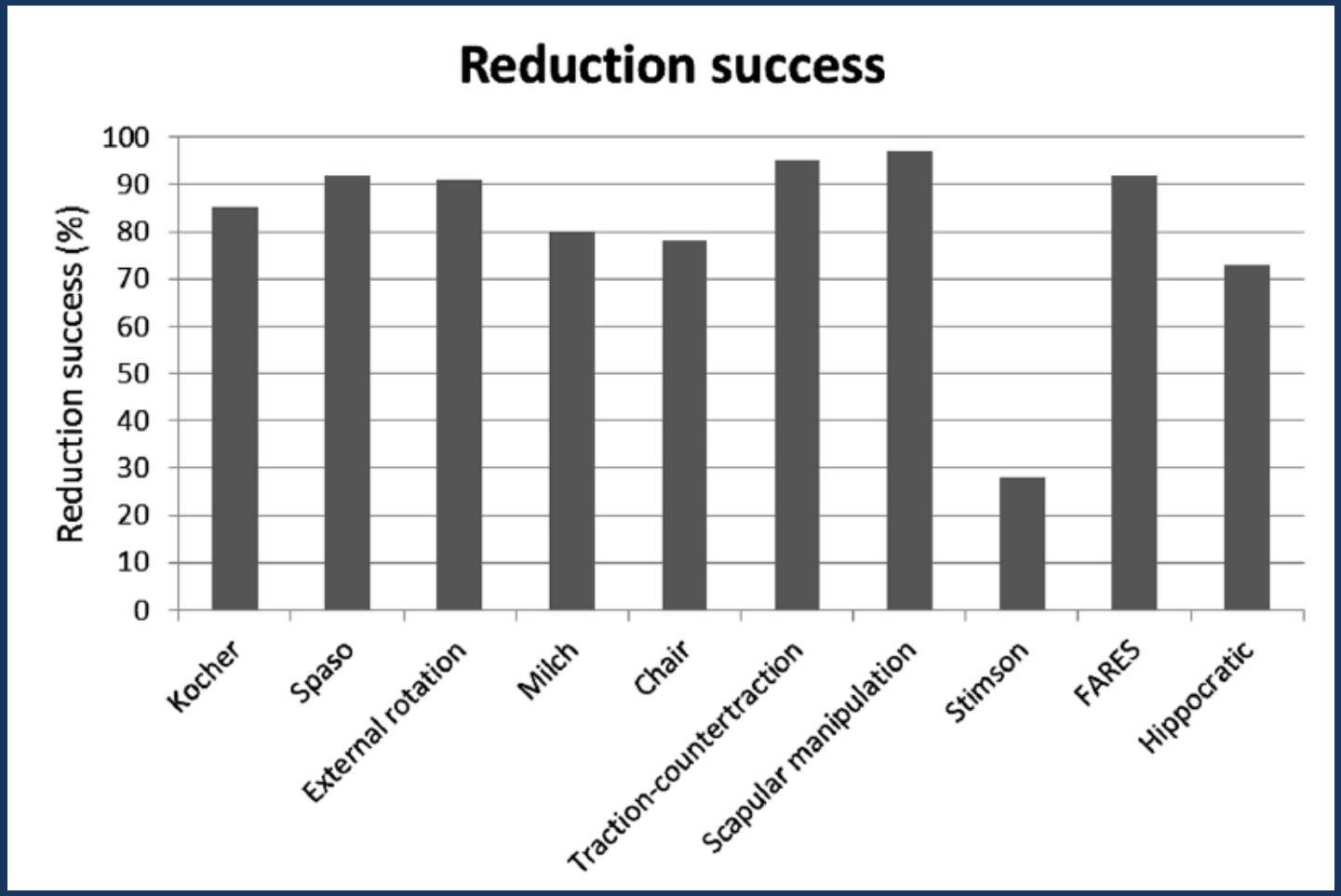
Stimson Method

Kocher Method

FARES

Scapular manipulation

Systematic Comparison



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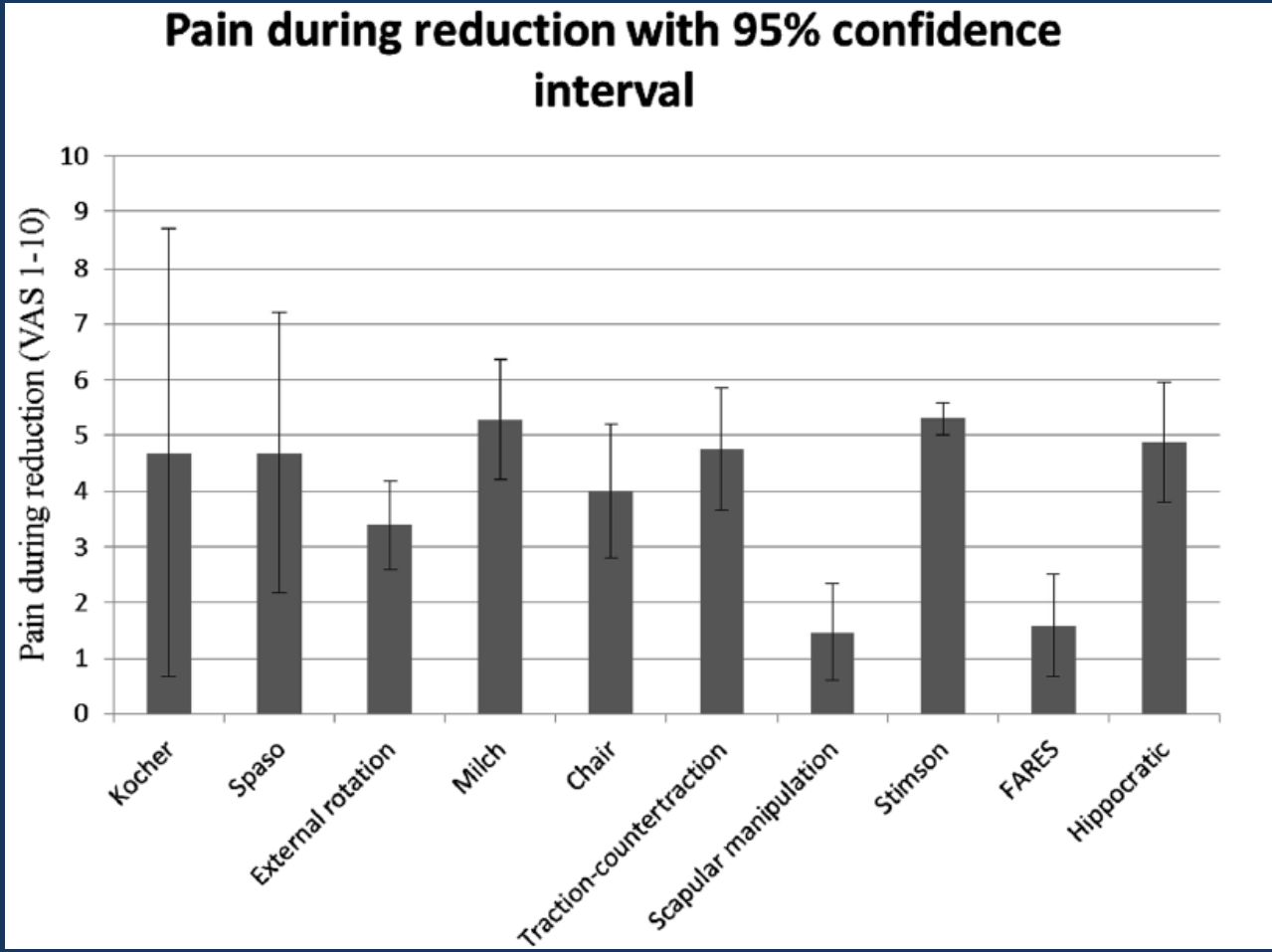

Elbow Dislocation

- Fall on an outstretched hand with the elbow slightly flexed
- Posterior and posterolateral dislocations account for 80 to 90%
- Quickly assess neurovascular structures
- Evaluate for possible concomitant fracture
- Most commonly occurs in football & wrestling

Elbow Reduction

Elbow Reduction

PIP Joint Dislocation

- Most common type of finger dislocation
  - Dorsal most common direction
- Reduction - axial traction, slight hyperextension, and direct pressure on the base of the middle phalanx
- RTP - if have minimal pain, no neurovascular compromise, full active PIP extension, and/or no rotation deformity
  - Buddy tape

Patellar Dislocation

- Mechanism
  - Twisting injury with the foot planted
  - Direct blow to the knee
- Reduction – press patella medially while extending the knee
- RTP – Need full ROM, normal strength & function and minimal or no pain
  - return to play in a patellar stabilizer brace

Patella Reduction

Fracture

- Clavicle
- Ankle
- Finger
- Scaphoid
- Hamate
- Distal radius/ulna
- Pelvic avulsion
- Stress fractures
- Growth plate injury

Ottawa Ankle Rule

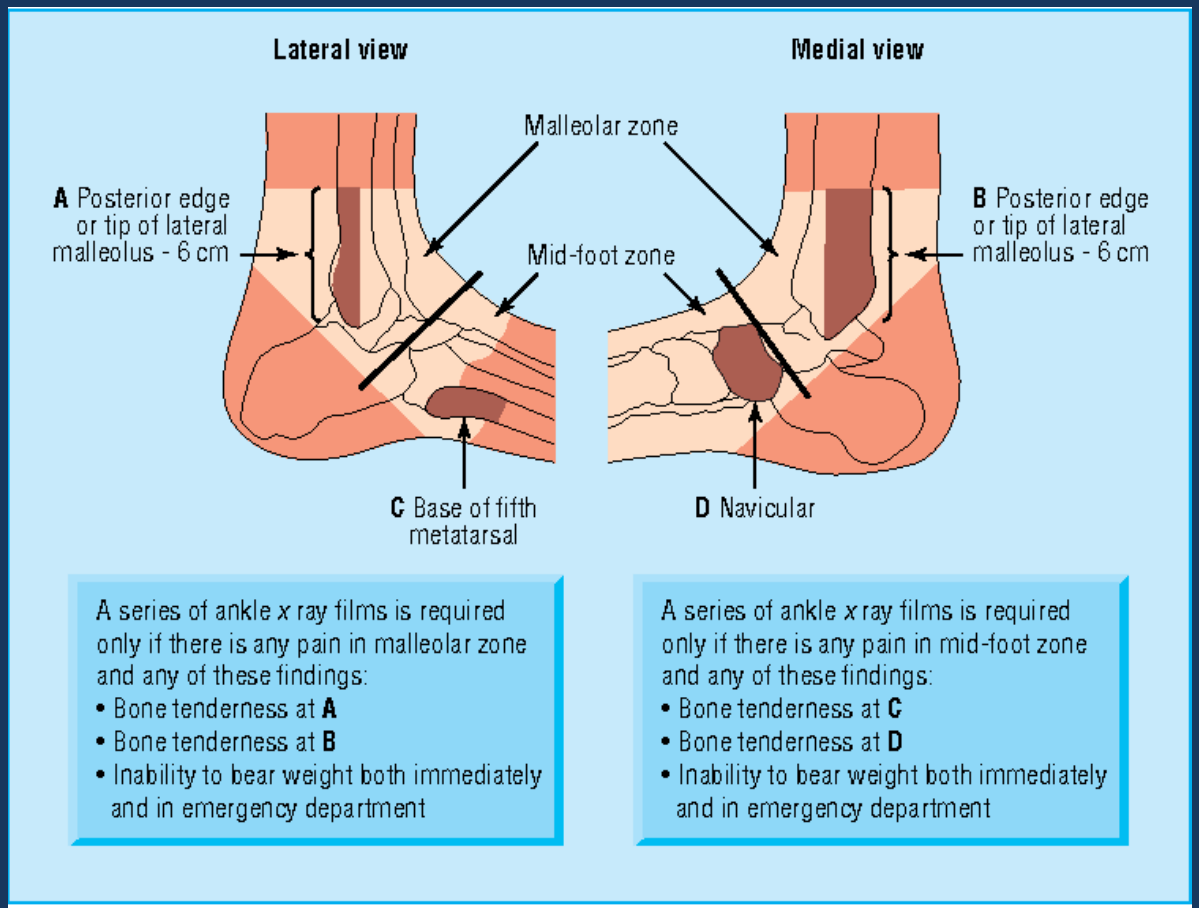

Fig 1 Ottawa ankle rules

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DENTAL INJURIES

Tooth Avulsion

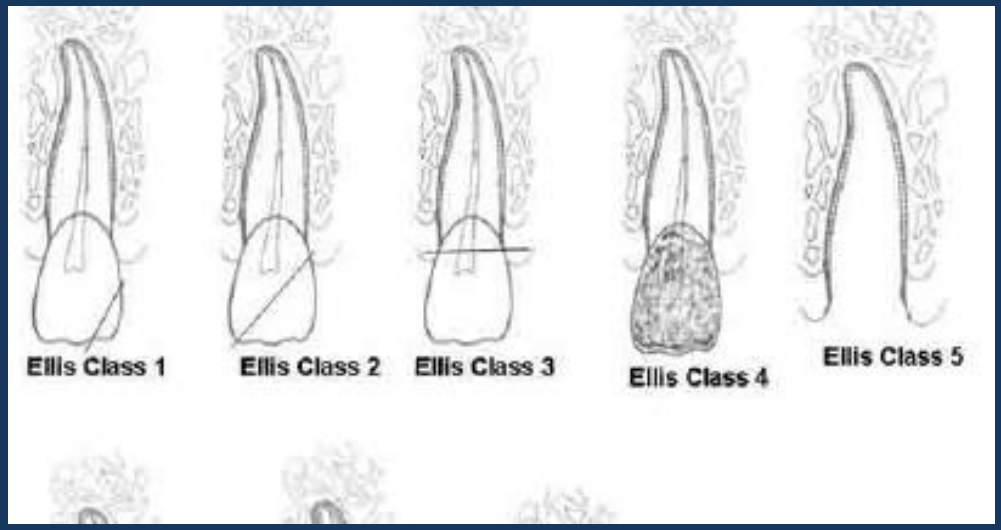
- Replace tooth as quickly as possible
- Use Storage medium if unable to replace
- Handle tooth by the crown
- Do not replace primary teeth

Storage Mediums

Dental Fracture

- Not an emergency
- Can reduce if significant luxation
- Can cover fx with composite adhesive or OTC crown repair cement
- Patient comfort is limiting factor

Type	Criterion
0	No trauma
I	Simple fracture of crown, involving little or no dentin
II	Extensive fracture of crown, involving considerable dentin, not the pulp
III	Extensive fracture of crown, involving considerable dentin, exposing pulp
IV	Nonvital tooth, without loss of crown structure
V	Total tooth loss
VI	Displacement of tooth, without fracture of crown or root



UCLA BRUINS SPORTS MEDICINE

OCULAR INJURIE

Ocular Injuries

Most Common

- “Black Eye”
- Eyelid Laceration
- Subconjunctival Hemorrhage
- Corneal abrasion
- Foreign Body
- Hyphema
- Traumatic iritis
- Orbital fracture

Eye Emergencies

- Corneal Laceration
- Retinal Detachment
- Lens Dislocation
- Blowout Fracture of the Orbit
- Ruptured Globe
- Optic Nerve Injury

Epidemiology

- Eye trauma
  - #1 Cause of non-congenital blindness <20yo
  - #4 Cause of visual loss <46yo
- 42,000 sports-related eye injuries evaluated in the ED annually
  - 72% occur in patients < 25
- 25% of all severe eye injuries are sports related
- 1.5% of sports injuries involve the eye[2]
- Approximately 90% of sports related eye injuries are preventable[3]

1 Reehal P. *Curr Sports Med Rep.* 2010.

2 Olson DE, Sikka RS, Pulling T et al. *Netter's Sports Medicine*. 2010

3 Pieper P. *J Emerg Nurs*. 2010

Emergency Eye Kit

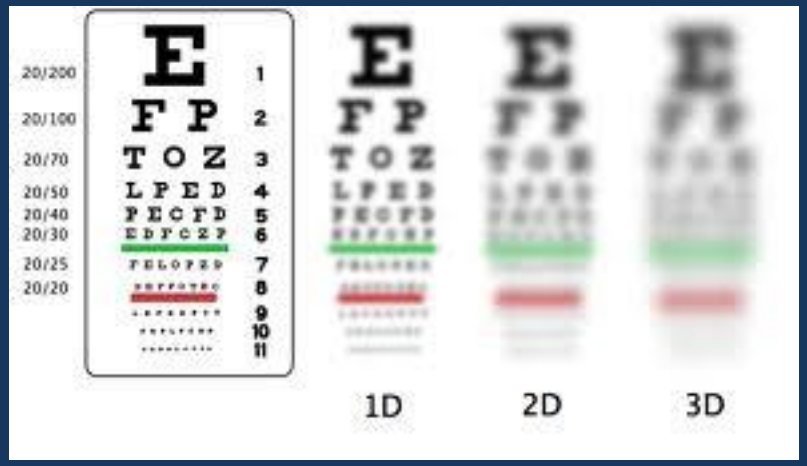
- Pocket Snellen chart
- Ophthalmoscope & or Penlight (with blue)
- Fluorescein strip
- Cotton-tip applicators
- Normal saline or water for irrigation
- Eye shield/patch

History

- Mechanism of Injury
- Symptoms
  - pain
  - decreased / loss of vision
  - diplopia
  - flashing lights/halos
  - floaters
  - PMH of eye disease / eye surgery

Brief Physical Exam

- Inspection & Palpation
- *** Visual Acuity ***
- Rule out obvious globe rupture
  - uvea protruding through laceration
  - distorted pupil
  - irregular iris
- Pupil size & if there is RAPD
- Extraocular eye movements

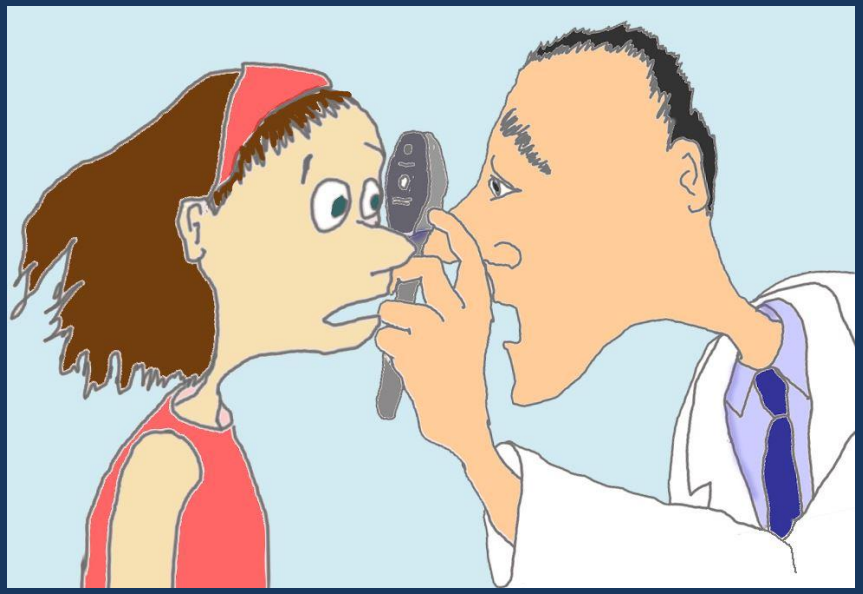


Detailed Physical Exam

- Eyelids/Orbit
  - symmetry
  - ptosis
  - proptosis
  - lacerations
  - fractures
  - sensation
  - lid closing/opening
- Pupil
  - dilated/asymmetric
- Conjunctiva
  - hemorrhage
- Sclera
- Iris
  - irregular
- Visual Fields
- Cornea/Anterior Chamber
  - hyphema
  - fluorescein
    - abrasions
    - foreign body
- EOM
  - restricted movement
  - report of diplopia

Detailed Physical Exam

- Direct Ophthalmoscope
  - fundus
  - red reflex
  - disk
  - vessels
  - macula
- Slit Lamp Exam



When to Refer

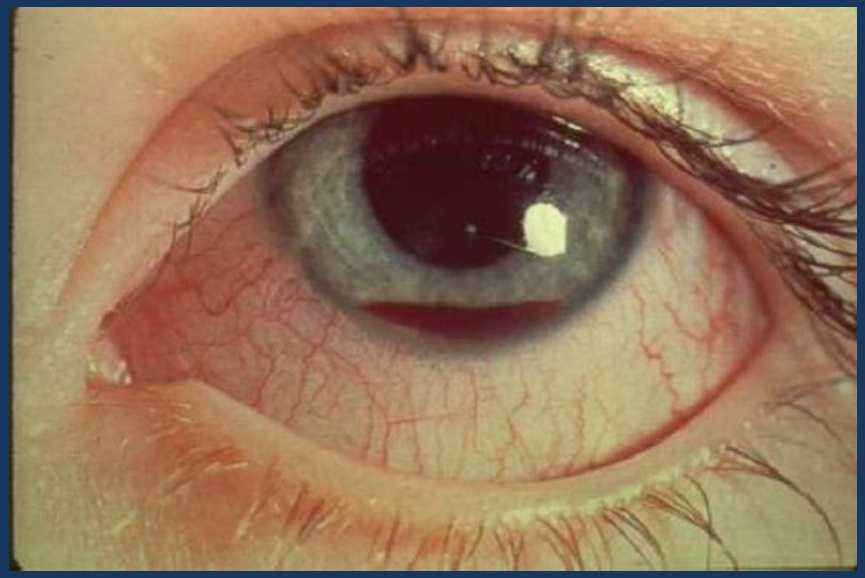
- Need for further evaluation (slit lamp)
- Unable to do thorough exam
- Severe injuries in need of further treatment
- Red flags

Examination Red Flags

- Loss of visual acuity
- Visual field cuts
- Hyphema
- Change in pupil
- Eye protrusion
- Orbit Asymmetry
- Abnormal mass on inspection
- Severe photophobia
- Light flashes or halos
- Complicated lacerations
- Abnormal EOM or pain with EOM
- Diplopia
- Persistent discomfort

Hyphema

- Most common intraocular injury
- Blood in the anterior chamber
- Iris is torn either at the pupil margin or the iris root
- Sx = blurred vision, photophobia & pain
- PE = Complete eye exam including **intraocular pressure** & slit-lamp
- Red blood cells floating would suggest a microhyphema



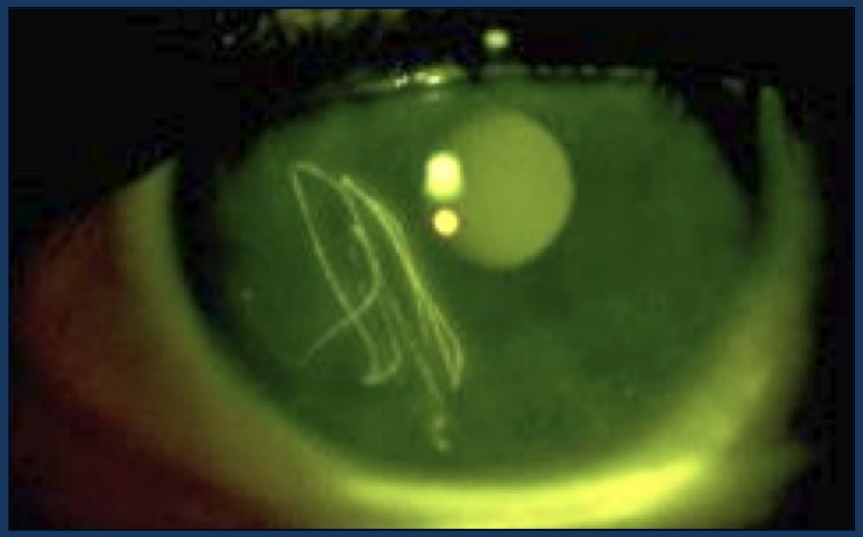
Hyphema Treatment

- Immediate ophthalmology referral
  - Strict bed rest with HOB 30 degrees
  - Eye shield – to decrease risk of re-bleed
  - NO NSAIDS
  - Daily f/u with ophtho to assess IOP
  - Restrict activity for 5-6 days – risk of re-bleed
- RTP = when resolved

Corneal Abrasion

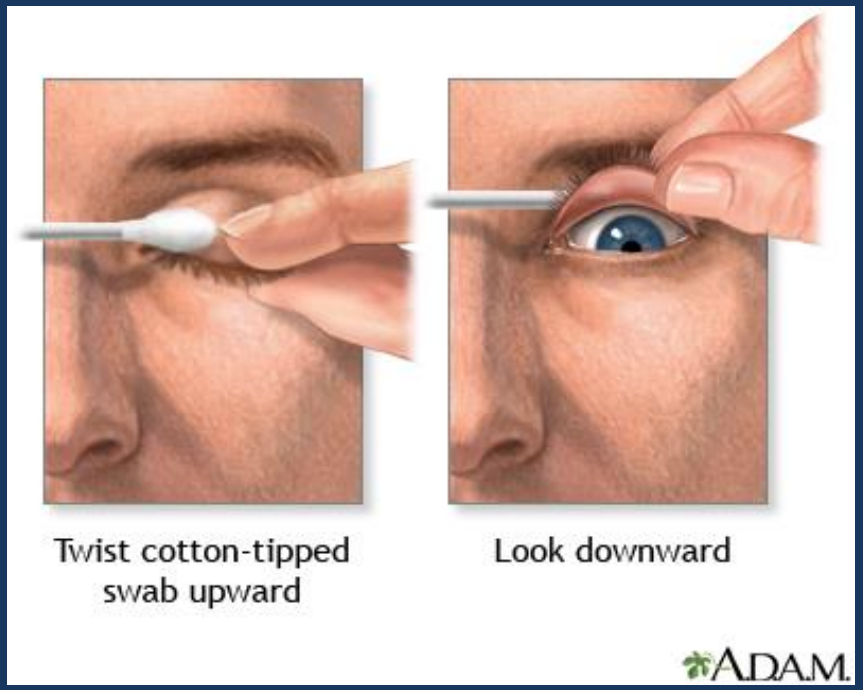
- Most common eye injury in sports
- Damage to surface epithelium
- Sx = sharp pain, photophobia, tearing & foreign body sensation

– PE = Full eye exam including upper lid to exclude foreign body
  – Fluorescein dye & cobalt blue light
  – Exam may require topical anesthetic drop



Corneal Abrasion

- Tx = Removal foreign body
  - Topical antibiotic
  - No need for patch
  - f/u if worsening/persistent symptoms
  - No contact lenses during treatment
- RTP = when completely heals (usually with in 3 days)

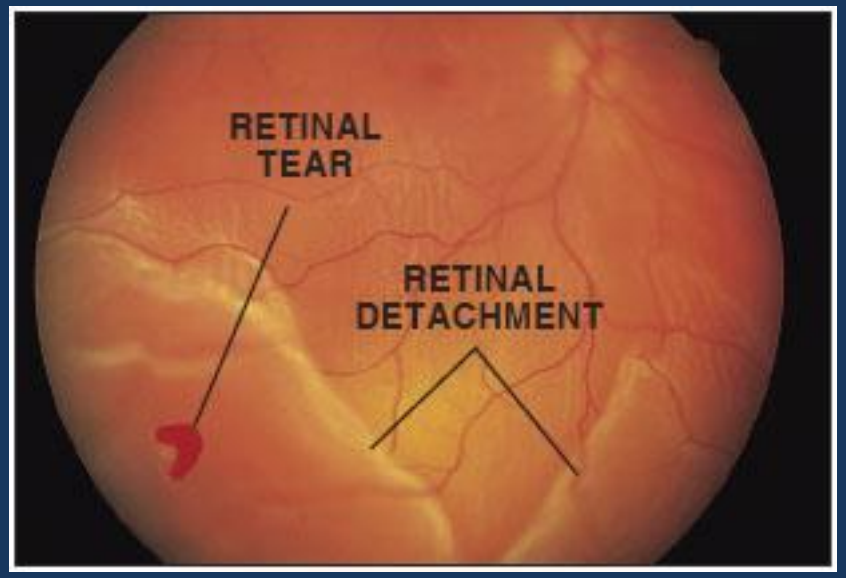


Subconjunctival Hemorrhage

- Very common after blunt trauma
- Sx = usually painless, may have mild irritation & red eye
- PE = **Blood does no obscure pupil/iris**
  - Assessment mainly focuses on r/o ruptured globe or foreign body
- Tx = Reassurance to the athlete
  - Most hemorrhages resolve in 2-3 weeks
- RTP = immediately w/o restrictions

Retinal Detachment

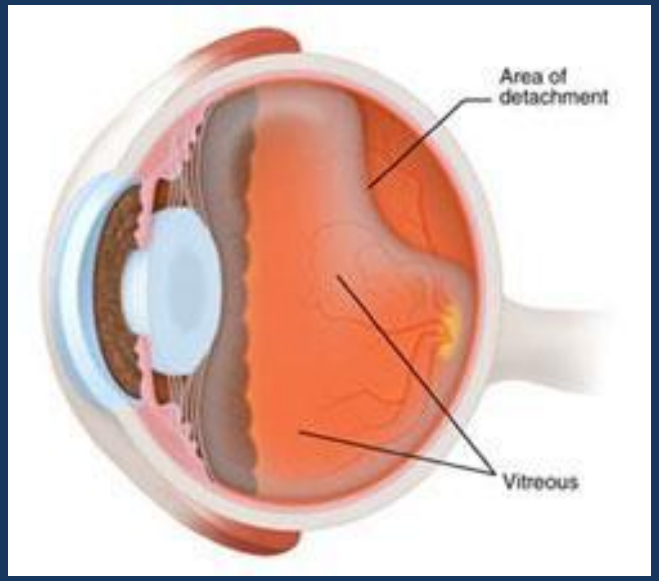
- Usually after direct trauma to the orbit or from significant head trauma
- Sx = complain of floaters or flashing lights, may have blind spot on edge of visual field, decreased vision
  - Can occur remote to trauma or hours after



- PE = must check confrontational visual field for defects
- Afferent pupil defect may be present if there is a large area of detachment
- Funduscopic exam – may be hard to see detachment

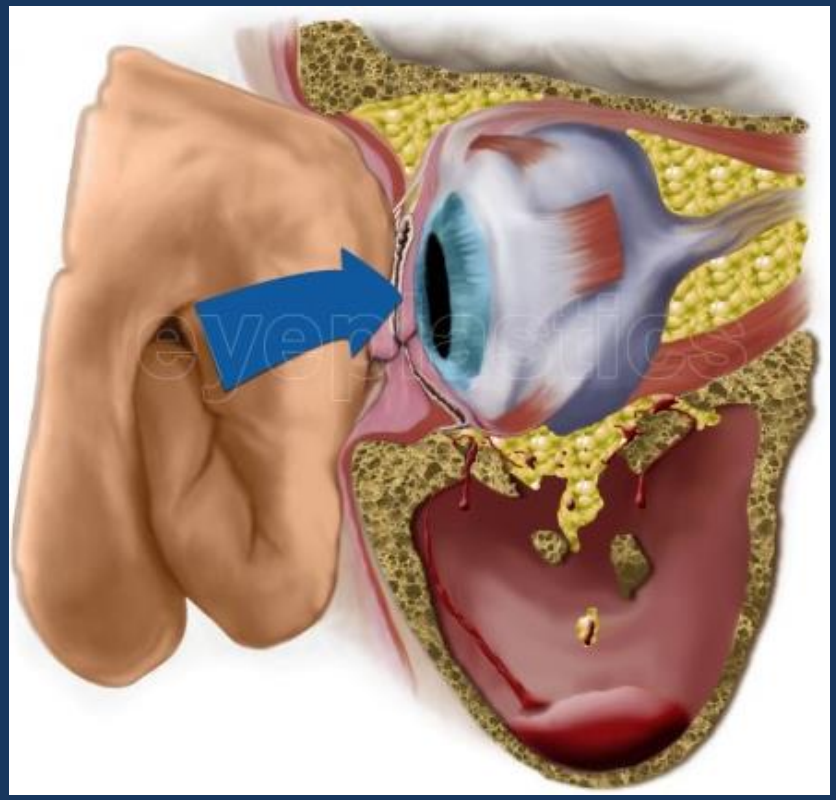
Retinal Detachment

- Tx = immediate eye protection
  - Immediate referral to ophtho for dilated exam
  - Can include laser (tears or holes) or surgery (detachment)
- RTP = when released by ophthalmologist
  - Depends on extent of the damage
  - 2 weeks is the minimum out of activity



Orbital Wall Fracture

- Seen after significant blunt eye trauma
- Symptoms
  - Localized pain & swelling
  - Change in visual acuity
  - Diplopia or numbness
  - Crepitus with nose blowing
- Exam
  - May have restricted EOM
  - Numbness to cheeks
  - Pain over orbit & sunken orbit

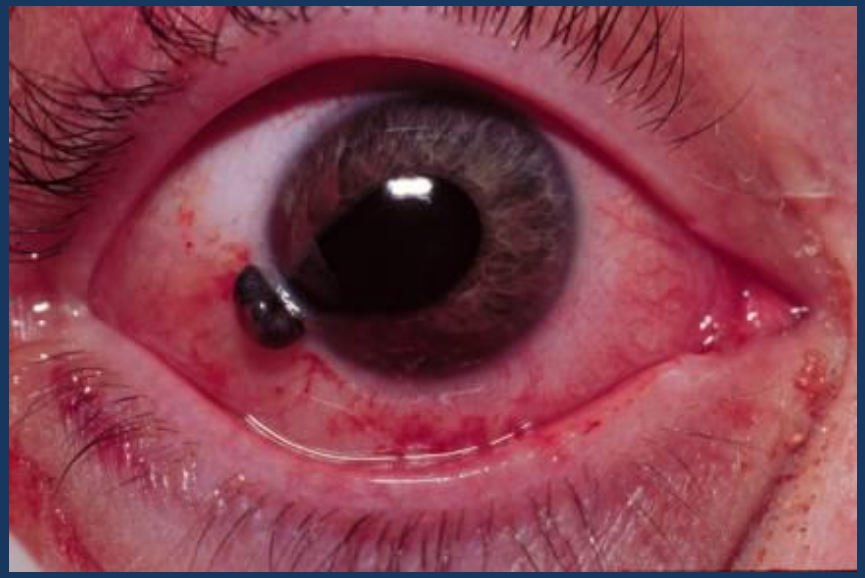


Orbital Wall Fracture

- Evaluation
  - CT scan (fine cuts)
- Treatment = Eval by ophtho
  - PO antibiotics & nasal decongestant
  - Ice, avoid nose blowing
- Surgical indications
  - Globe malposition
  - Enophthalmos
  - Large fracture
  - Muscle entrapment
- RTP = Clearance from eye specialist

Ruptured Globe

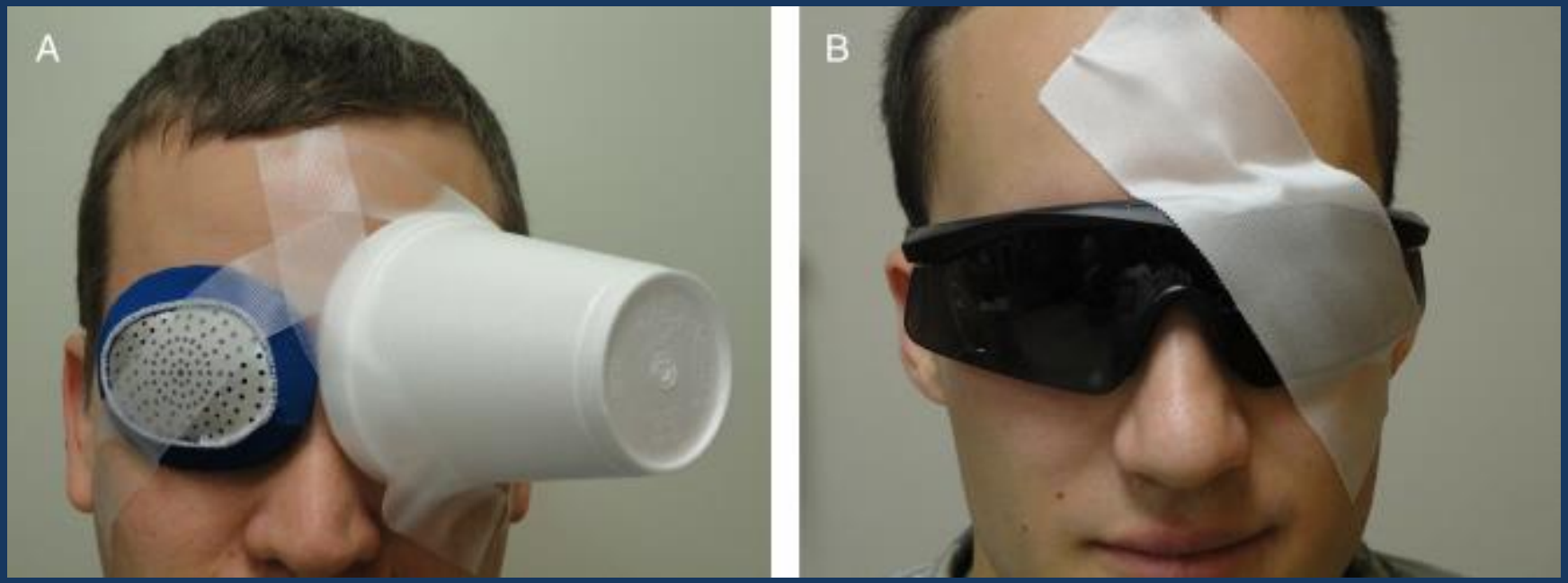
- Occur from direct trauma to the orbit or significant head trauma
- Sx = may complain of vision loss or eye pain
  - Can have similar symptoms to retinal detachment
- PE = NO PRESSURE TO THE GLOBE
  - Uvea protruding
  - Irregular or non-reactive pupil
  - Decreased visual acuity
  - No red reflex



Ruptured Globe

- Tx = Cover immediately (no pressure to globe) and send for immediate ophtho exam
  - DO NOT attempt to remove penetrating object
  - Make NPO – high probability for surgical exploration & repair
  - Keep supine/upright
  - No nose blowing
  - Anti-emetics
- RTP = in conjunction with an ophthalmologist

Eye Shields

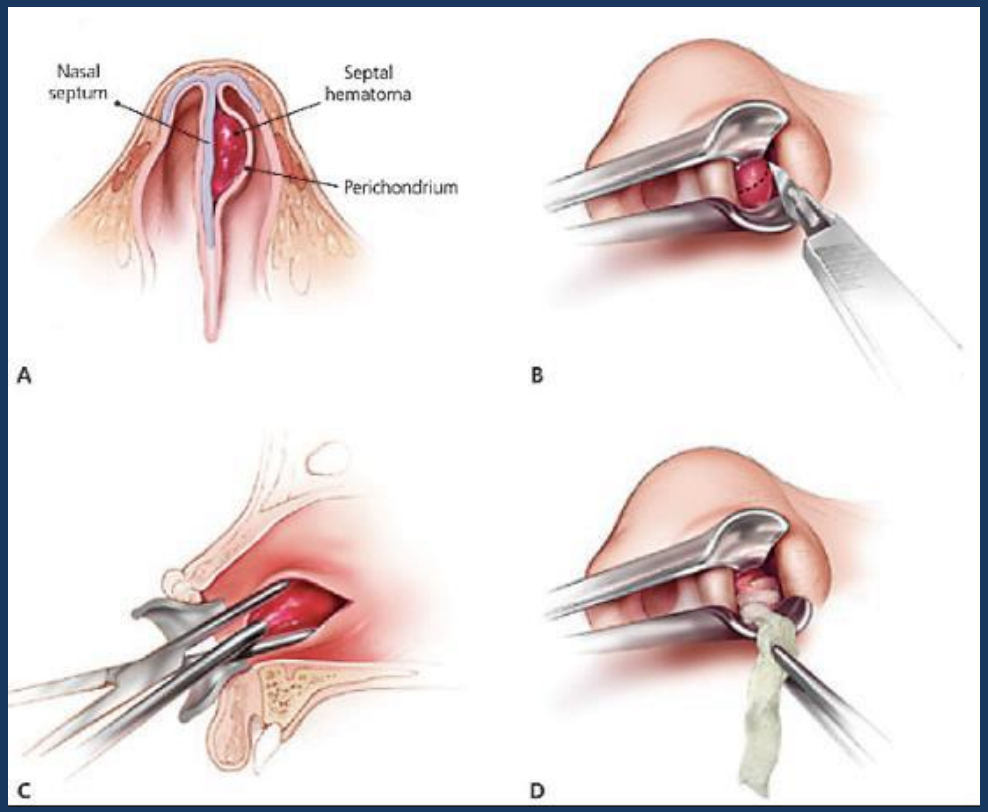


NASAL TRAUMA

Nasal Fracture

- Most common facial fracture
- Evaluate for periorbital findings
- No need for imaging if isolated
- Reductions are best performed non-emergently

Septal Hematoma



Return to Play

- Full ROM without pain
- 90% strength vs uninvolved side
- Normal neurovascular status
- Normal proprioception
- Functional tests
  - Cardiovascular fitness
  - Sport-specific testing
- Desire to return (psychological)

Lower Extremity Functional Tests

- Toe Raises
- Single leg hops
- Four squares
- Mini squats
- Duck walk
- Cutting drills/figure 8
- Carioca
- Single leg hop for distance
- Triple hop for distance

Upper Extremity Functional Tests

- Against wall
  - Wall push up
  - Two hand ball balance
  - Single arm ball balance
- On Floor
  - Push up
  - Two hand ball balance/ball push up
  - Plyo-push up
  - Wheelbarrow
  - Plank

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